INSTALLATION INSTRUCTIONS FOR THE TRUSTABILITY™ BOARD MOUNT PRESSURE SENSORS, DPR SERIES

32347060
Issue B

1.0 GENERAL INFORMATION

The TruStability™ DPR Series is a piezoresistive silicon pressure sensor offering a ratiometric analog output for reading pressure over the specified full scale pressure span and temperature range. These sensors are fully calibrated and temperature compensated for sensor offset, sensitivity, temperature effects, and non-linearity using an on-board Application Specific Integrated Circuit (ASIC).

CAUTION

PRODUCT DAMAGE FOR SENSORS WITH LIQUID MEDIA OPTION (ONLY AVAILABLE 60 MBAR | 6 KPA | 1 PSI AND ABOVE)

- Ensure liquid media is applied to Port 1 only; Port 2 is not compatible with liquids.
- Ensure liquid media contains no particulates. All TruStability™ sensors are dead-ended devices. Particulates can accumulate inside the sensor, causing damage or affecting sensor output.
- Recommend that the sensor be positioned with Port 1 facing downwards; any particulates in the system are less likely to enter and settle within the pressure sensor if it is in this position.
- Ensure liquid media does not create a residue when dried; build-up inside the sensor may affect sensor output. Rinsing of a dead-ended sensor is difficult and has limited effectiveness for removing residue.
- Ensure liquid media are compatible with wetted materials. Noncompatible liquid media will degrade sensor performance and may lead to sensor failure.

Failure to comply with these instructions may result in product damage.

2.0 CLEANING

CAUTION

IMPROPER CLEANING

Avoid cleaning the sensor; however, if it must be cleaned ensure cleaning fluids, such as appropriate alcohols or fluorinated solvents, are used based on the type of contaminants to be removed. Do not immerse the sensor. **Failure to comply with these instructions may result in product damage.**

3.0 SPECIFICATIONS AND MOUNTING DIMENSIONS

See Tables 1 through 8, and Figures 3 through 6.

TABLE 1. ABSOLUTE MAXIMUM RATINGS[1]

CHARACTERISTIC	MIN.	MAX.	UNIT
Supply voltage (V_{supply})	-5.0	12.0	Vdc
Voltage on output pin	-0.3	6.0	Vdc
Working pressure	—	135	inH_2O
Overpressure	—	270	inH_2O
Burst pressure	—	415	inH_2O

[1]Absolute maximum ratings are the extreme limits the device will withstand without damage.

TABLE 2. ENVIRONMENTAL SPECIFICATIONS

CHARACTERISTIC	PARAMETER
Humidity	0 %RH to 95 %RH, non-condensing
Vibration	15 g, 10 Hz to 2 kHz
Shock	100 g, 6 ms duration
ESD susceptibility	3 kV min, human body model
Life[1]	1 million pressure cycles minimum
Orientation sensitivity (±1 g)	±0.08 %FSS typical

[1]Life may vary depending on the specific application in which the sensor is utilized.

TABLE 3. WETTED MATERIALS[1]

COMPONENT	MATERIAL	
	PORT 1 (PRESSURE PORT)	PORT 2 (REFERENCE PORT)
Ports and covers	high temperature polyamide	
Substrate	alumina ceramic	
Adhesives	epoxy, silicone	
O-Ring	silicone rubber	
Electronic components	ceramic, silicon, glass, solder	silicon, glass, gold

[1] Contact Honeywell Customer Service for detailed material information.

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TABLE 4. SENSOR PRESSURE TYPES

PRESSURE TYPE	DESCRIPTION
Differential	Output is proportional to the difference between the pressures applied to each port (Port 1 - Port 2).

TABLE 5. OPERATING SPECIFICATIONS

CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT
Supply voltage (V_{supply})[1]	4.75	5.0	5.25	Vdc
Minimum operating voltage	3.0	—	—	Vdc
Supply current	—	2.7	3.5	mA
Operating temperature range[2]	-40 [-40]	—	85 [185]	°C [°F]
Compensated temperature range[3]	-20 [-4]	—	70 [158]	°C [°F]
Startup time (power up to data ready)	—	—	5	ms
Response time	—	1	—	ms
Clipping limits: upper lower	 — 2.5	 — —	 97.5 —	 %V_{supply}
Accuracy[4]	—	—	±0.25	%FSS BFSL[6]
Output resolution	—	0.033	—	%FSS[6]
Orientation sensitivity (±1 g)[5]: ≤40 mbar | 4 kPa | 20 inH_2O ≤2.5 mbar | 250 kPa | 1 inH_2O	 — —	 ±0.1 ±0.2	 — —	 %FSS[6]

[1]Ratiometricity of the sensor (the ability of the device output to scale to the supply voltage) is achieved within the specified operating voltage.

[2]**Operating temperature range:** The temperature range over which the sensor will produce an output proportional to pressure.

[3]**Compensated temperature range:** The temperature range over which the sensor will produce an output proportional to pressure within the specified performance limits.

[4]**Accuracy:** The maximum deviation in output from a Best Fit Straight Line (BFSL) fitted to the output measured over the pressure range. Includes all errors due to pressure non-linearity, pressure hysteresis, and non-repeatability.

[5]**Orientation sensitivity:** The maximum change in offset of the sensor due to a change in position or orientation relative to Earth's gravitational field.

[6]**Full Scale Span (FSS):** The algebraic difference between the output signal measured at the maximum (Pmax.) and minimum (Pmin.) limits of the pressure range. (See Figure 7 for ranges).

FIGURE 1. TEB COMPONENTS FOR TRUSTABILITY™ BOARD MOUNT PRESSURE SENSORS

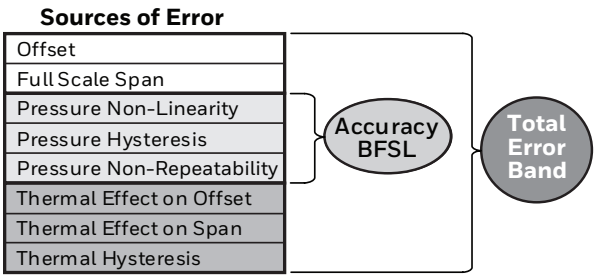
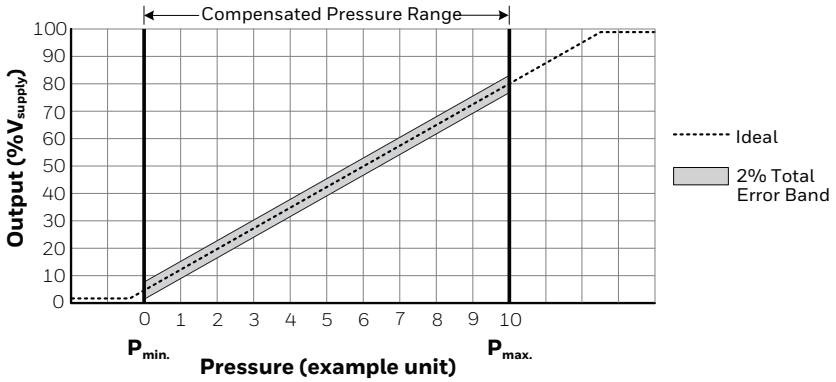
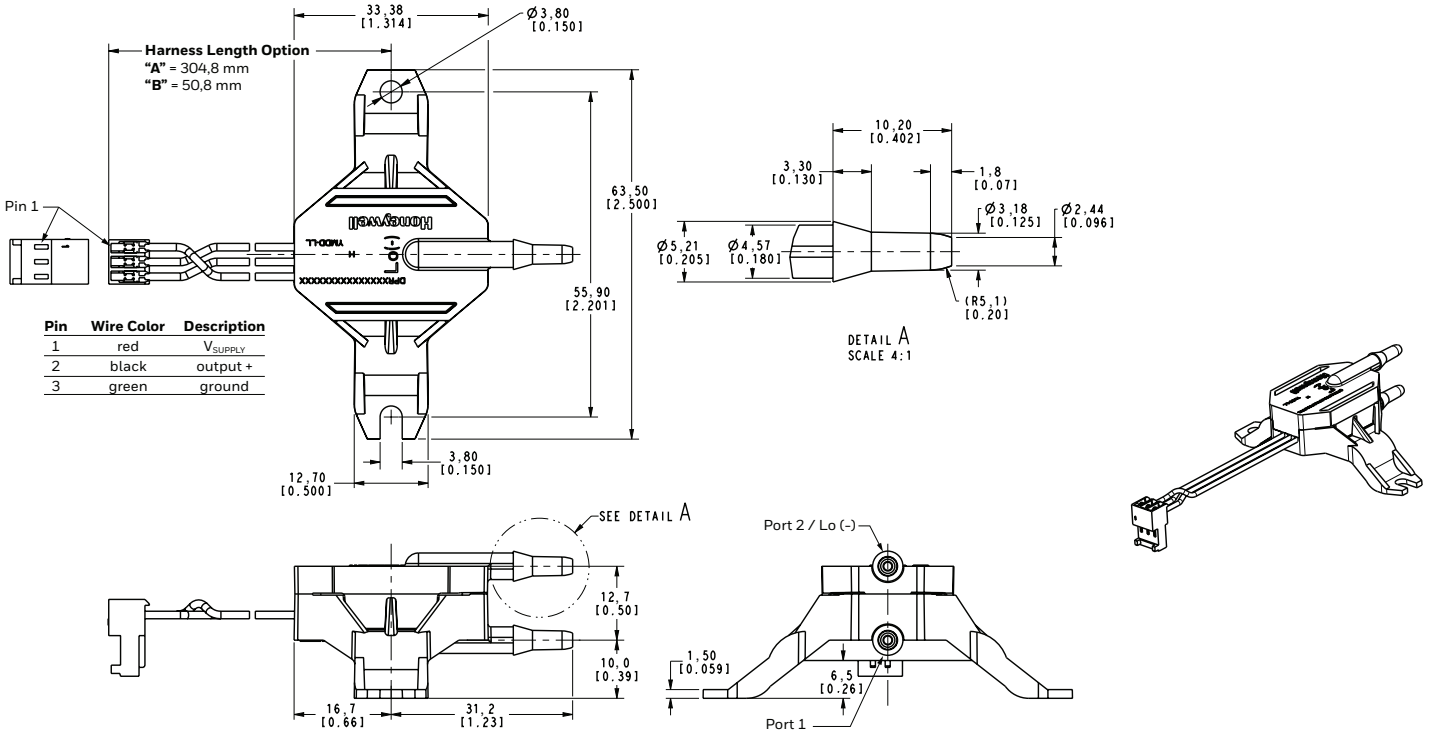


FIGURE 2. TRANSFER FUNCTION LIMITS



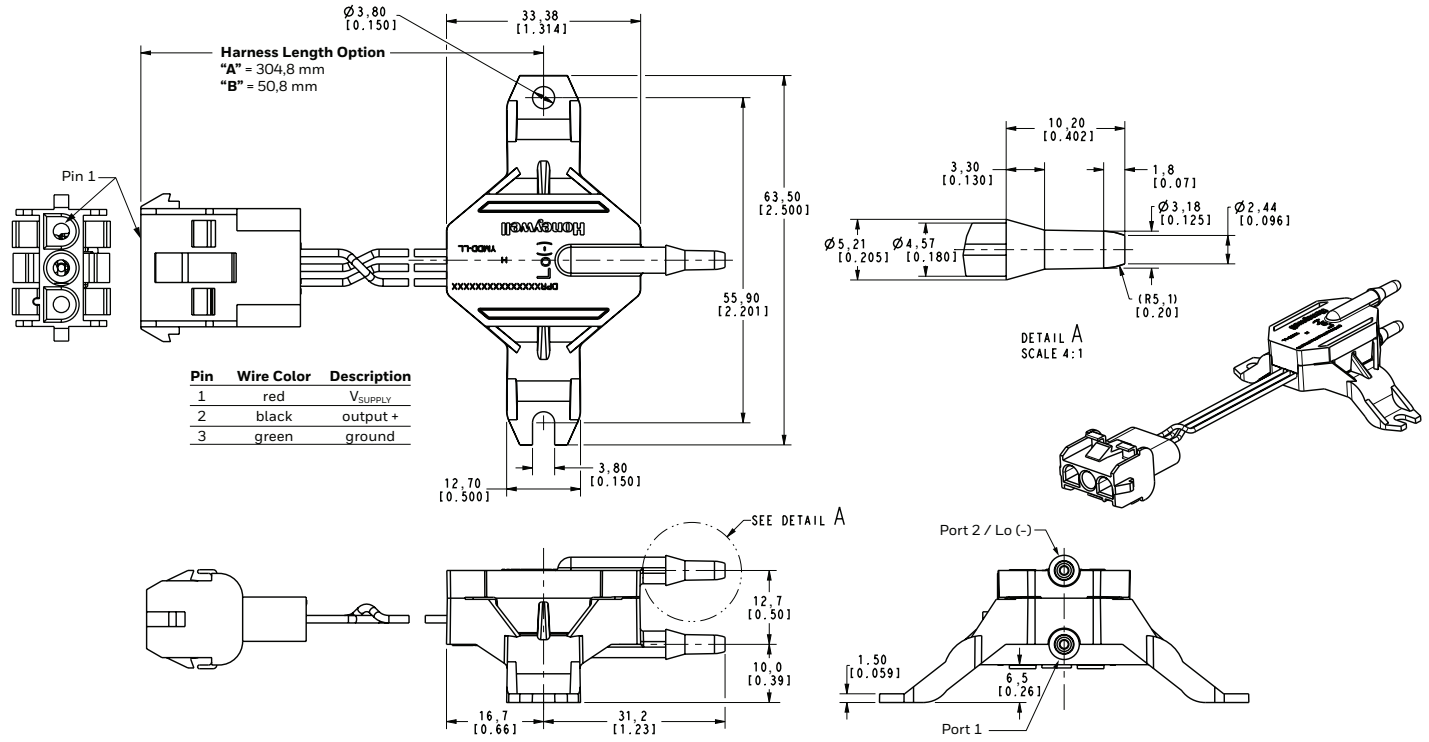
$$\text{Output (V)} = \frac{0.75 \times V_{supply}}{P_{max.} - P_{min.}} \times (\text{Pressure}_{applied} - P_{min.}) + 0.05 \times V_{supply}$$

FIGURE 3. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION, OPTION "A": AMP 3-643814-3 (FOR REFERENCE ONLY: MM/[IN].



Pin	Wire Color	Description
1	red	V_{SUPPLY}
2	black	output +
3	green	ground

FIGURE 4. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION OPTION "B": AMP 1-480701-0 (FOR REFERENCE ONLY: MM/[IN].



Pin	Wire Color	Description
1	red	V_{SUPPLY}
2	black	output +
3	green	ground

FIGURE 5. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION OPTION "C": FLYING LEADS (FOR REFERENCE ONLY: MM/[IN].

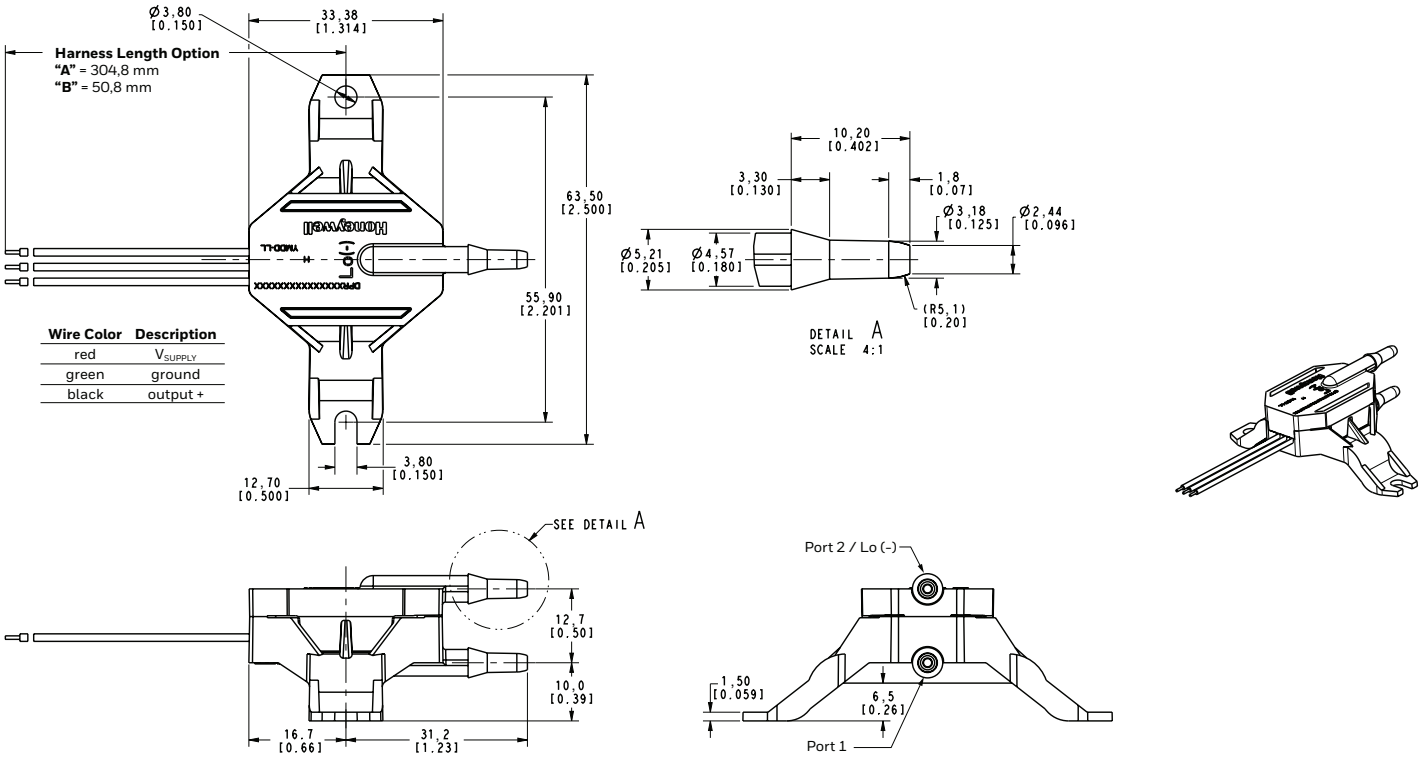


FIGURE 6. MOUNTING DIMENSIONS FOR ELECTRICAL TERMINATION OPTION "D": MOLEX 39-01-4033 (FOR REFERENCE ONLY: MM/ [IN].

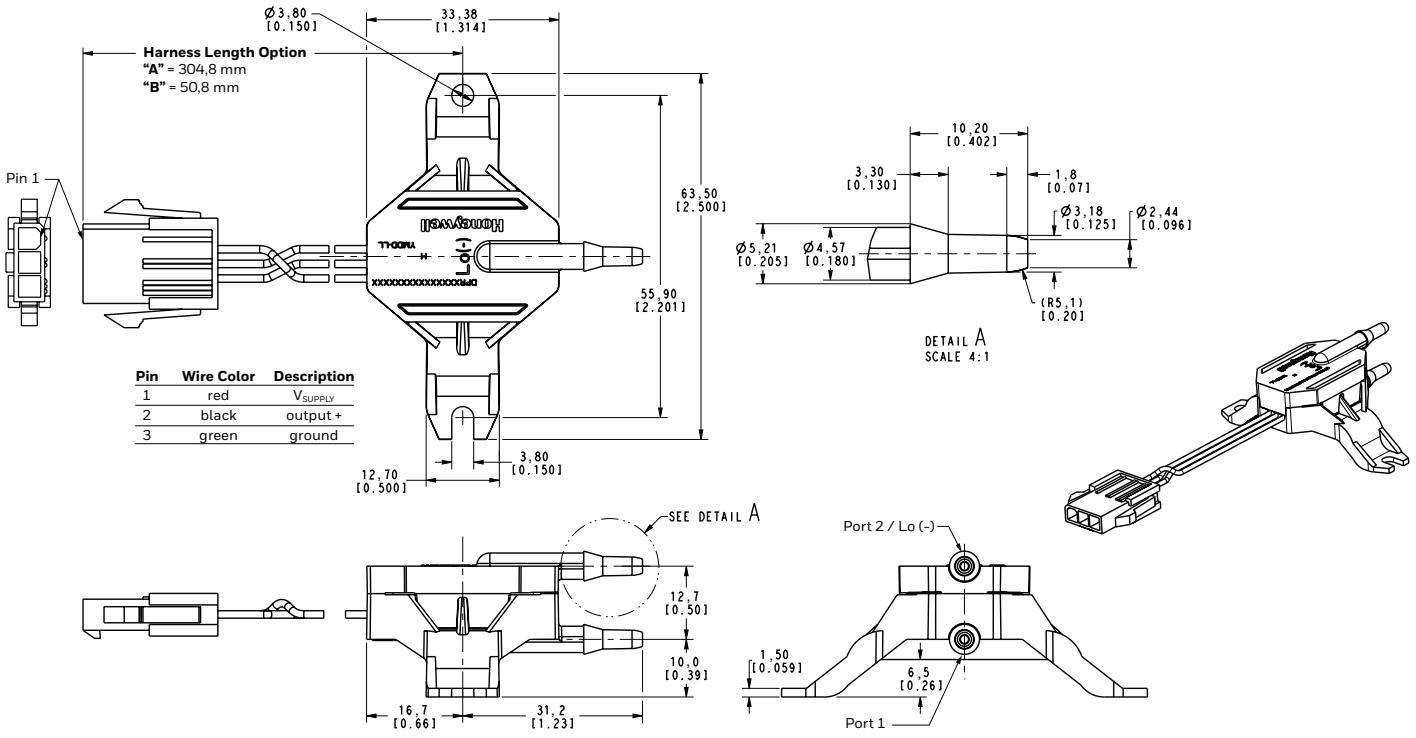


FIGURE 7. NOMENCLATURE AND ORDER GUIDE

For example, **DPRCAN0002NG0000A5** defines a DPR Series, Standard Accuracy, Compensated/Amplified, flying leads, 304,8 mm harness length, no gel, 0 inH_2O to 2 inH_2O pressure range, analog output type, 5% to 80% of V_{supply} transfer function, 5.0 Vdc supply voltage.

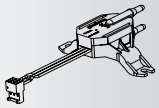
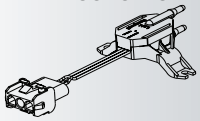
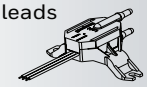
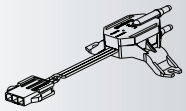
D P R C A N 0 0 0 2 N G 0 0 0 0 A 5

($P_{max.}$ | unit, reference | $P_{min.}$)

Product Series

DPR	Standard accuracy, compensated/amplified

Electrical Termination

A	AMP 3-643814-3 
B	AMP 1-480701-0 
C	Flying leads 
D	Molex 39-01-4033 

Harness Length

A	304,8 mm
B	50,8 mm

Gel

N	No gel

Supply Voltage

5	5.0 Vdc

Transfer Function

A	5% to 80% of V_{supply} (analog output)
B	10% to 90% of V_{supply} (analog output)

Pressure Range

Differential		*Gage*	
01.6MDN1.6	±1.6 mbar	**02.5MG0000**	0 mbar to 2.5 mbar
02.5MDN2.5	±2.5 mbar	**0004MG0000**	0 mbar to 4 mbar
0004MDN004	±4 mbar	**0006MG0000**	0 mbar to 6 mbar
0006MDN006	±6 mbar	**0010MG0000**	0 mbar to 10 mbar
0010MDN010	±10 mbar	**0016MG0000**	0 bar to 16 mbar
0016MDN016	±16 mbar	**0025MG0000**	0 bar to 25 mbar
0025MDN025	±25 mbar	**0040MG0000**	0 bar to 40 mbar
0160LDN160	±160 Pa	**0250LG0000**	0 Pa to 250 Pa
0250LDN250	±250 Pa	**0400LG0000**	0 Pa to 400 Pa
0400LDN400	±400 Pa	**0600LG0000**	0 Pa to 600 Pa
0600LDN600	±600 Pa	**0001KG0000**	0 kPa to 1 kPa
0001KDN001	±1 kPa	**01.6KG0000**	0 kPa to 1.6 kPa
01.6KDN1.6	±1.6 kPa	**02.5KG0000**	0 kPa to 2.5 kPa
02.5KDN2.5	±2.5 kPa	**0004KG0000**	0 kPa to 4 kPa
00.5NDN0.5	±0.5 inH_2O	**0001NG0000**	0 inH_2O to 1 inH_2O
0001NDN001	±1 inH_2O	**0002NG0000**	0 inH_2O to 2 inH_2O
0002NDN002	±2 inH_2O	**0005NG0000**	0 inH_2O to 5 inH_2O
0005NDN005	±5 inH_2O	**0009NGN.75**	-0.75 inH_2O to 9 inH_2O
0010NDN010	±10 inH_2O	**0010NG0000**	0 inH_2O to 10 inH_2O
		0014NGN.40	-0.40 inH_2O to 14 inH_2O
		0020NG0000	0 inH_2O to 20 inH_2O

⚠ WARNING
PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

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32347060-B-EN | B | 05/21
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